

(1) حساب النهايتين :

• لدينا :  $\lim_{\substack{x \rightarrow 0 \\ x > 0}} \frac{1}{x^2} = +\infty$  و  $\lim_{\substack{x \rightarrow 0 \\ x > 0}} e^{\frac{1}{x}} = +\infty$

ومنه :  $\lim_{\substack{x \rightarrow 0 \\ x > 0}} f(x) = \lim_{\substack{x \rightarrow 0 \\ x > 0}} \frac{1}{x^2} \cdot e^{\frac{1}{x}} = +\infty$

• لدينا :  $\lim_{x \rightarrow +\infty} \frac{1}{x^2} = 0$  و  $\lim_{x \rightarrow +\infty} e^{\frac{1}{x}} = e^0 = 1$

ومنه :  $\lim_{x \rightarrow +\infty} f(x) = \lim_{x \rightarrow +\infty} \frac{1}{x^2} \cdot e^{\frac{1}{x}} = 0$

(2) حساب  $f'(x)$  :

ليكن  $x$  عنصرا من  $\mathbb{R}_+^*$  . لدينا :

$$f(x) = \frac{1}{x^2} \cdot e^{\frac{1}{x}}$$

ومنه :  $f'(x) = \left(\frac{1}{x^2}\right)' e^{\frac{1}{x}} + \frac{1}{x^2} \cdot \left(e^{\frac{1}{x}}\right)'$

$$= -\frac{2}{x^3} e^{\frac{1}{x}} + \left(\frac{1}{x^2}\right) \left(\frac{1}{x}\right)' e^{\frac{1}{x}}$$

$$= -\frac{2}{x^3} e^{\frac{1}{x}} + \left(\frac{1}{x^2}\right) \left(-\frac{1}{x^2}\right) e^{\frac{1}{x}}$$

$$= -\frac{2}{x^3} e^{\frac{1}{x}} - \frac{1}{x^4} e^{\frac{1}{x}}$$

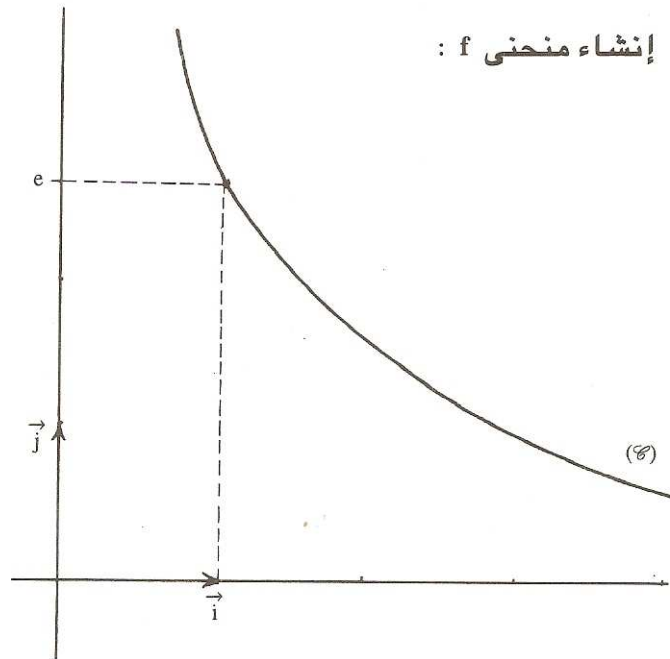
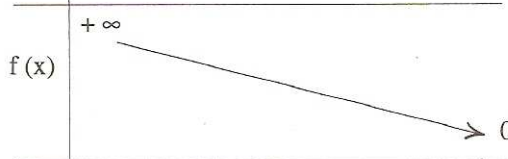
إذن :  $f'(x) = -\frac{1}{x^4} e^{\frac{1}{x}} (2x+1)$  لكل  $x > 0$  .

(3) جدول تغيرات  $f$  :

بما أن  $x > 0$  و  $e^{\frac{1}{x}} > 0$  و  $\frac{1}{x^4} > 0$  فإن :

$f'(x) < 0$  لكل  $x$  من  $]0, +\infty[$  .

x	0	$+\infty$
f'(x)		-
f(x)	$+\infty$	0



Achamel